

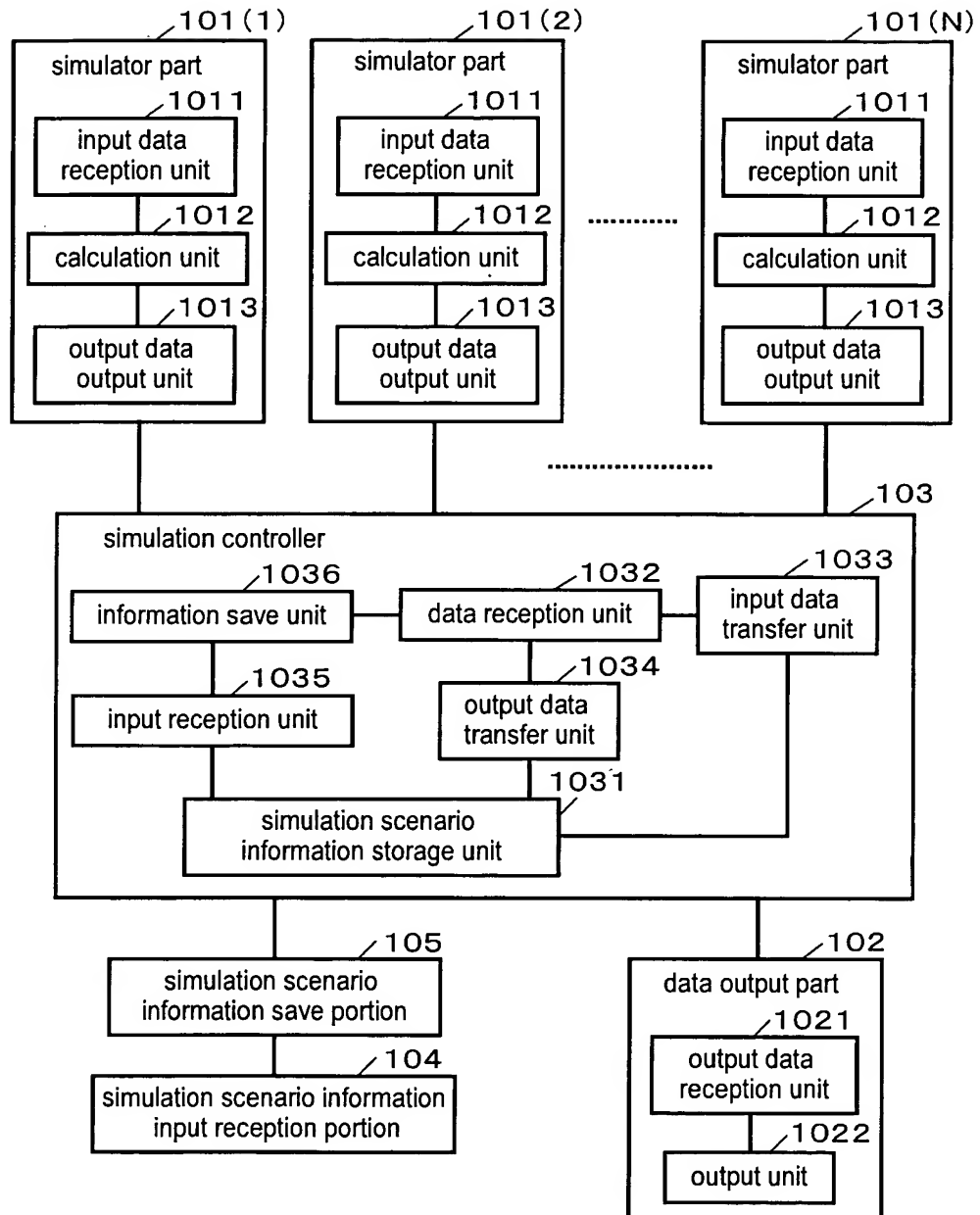
FIG.1

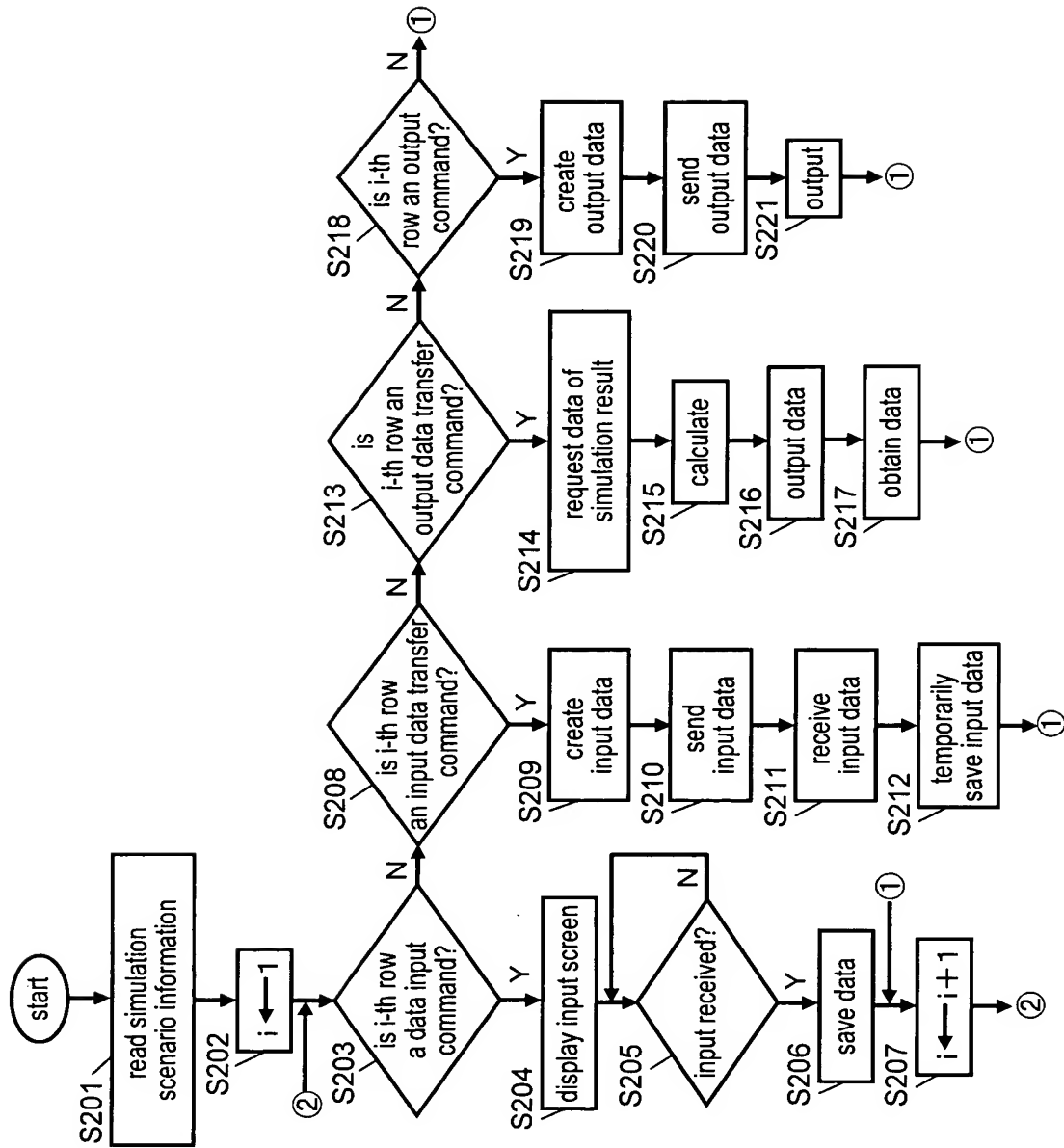
FIG.2

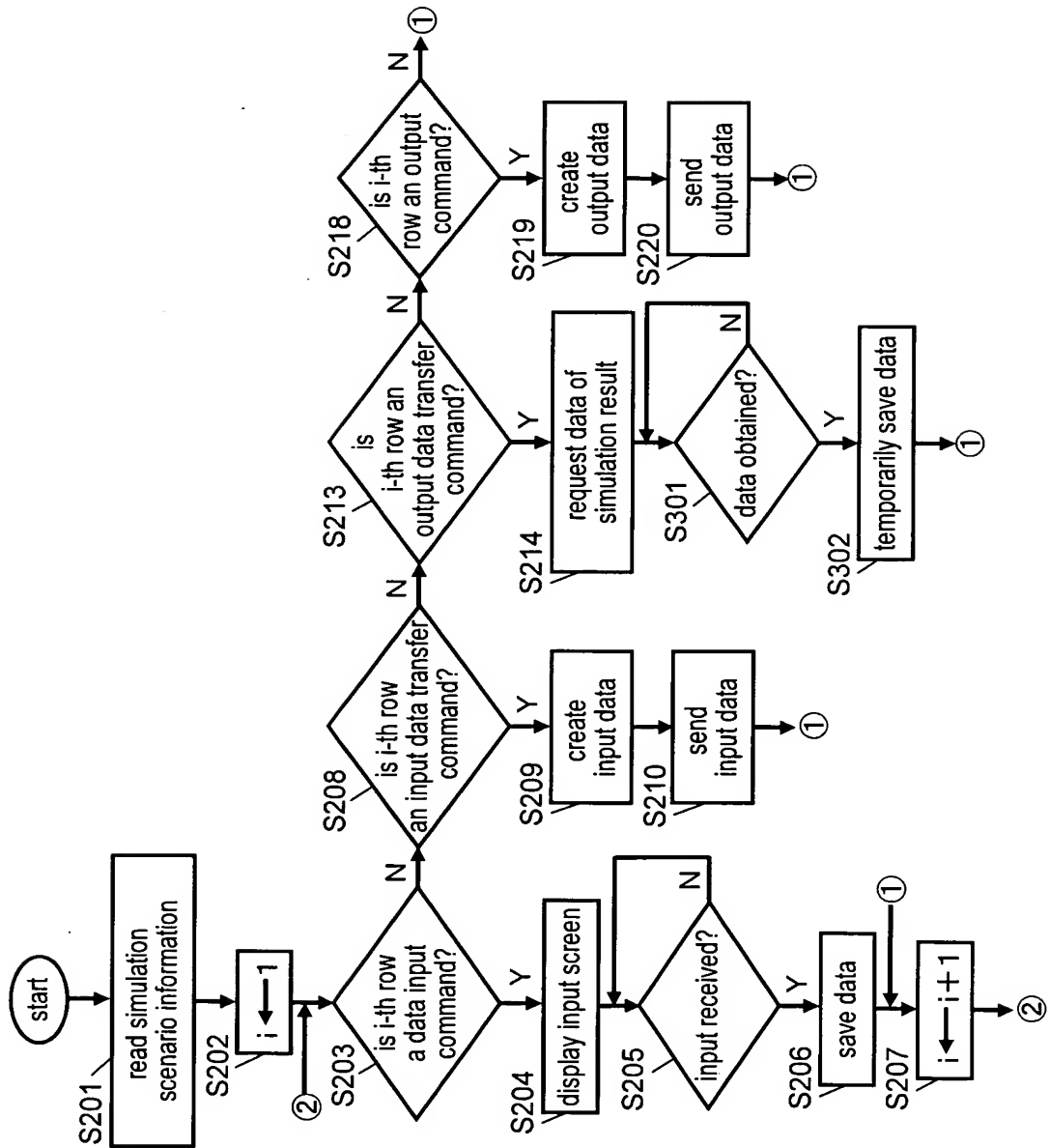
FIG.3

FIG.4

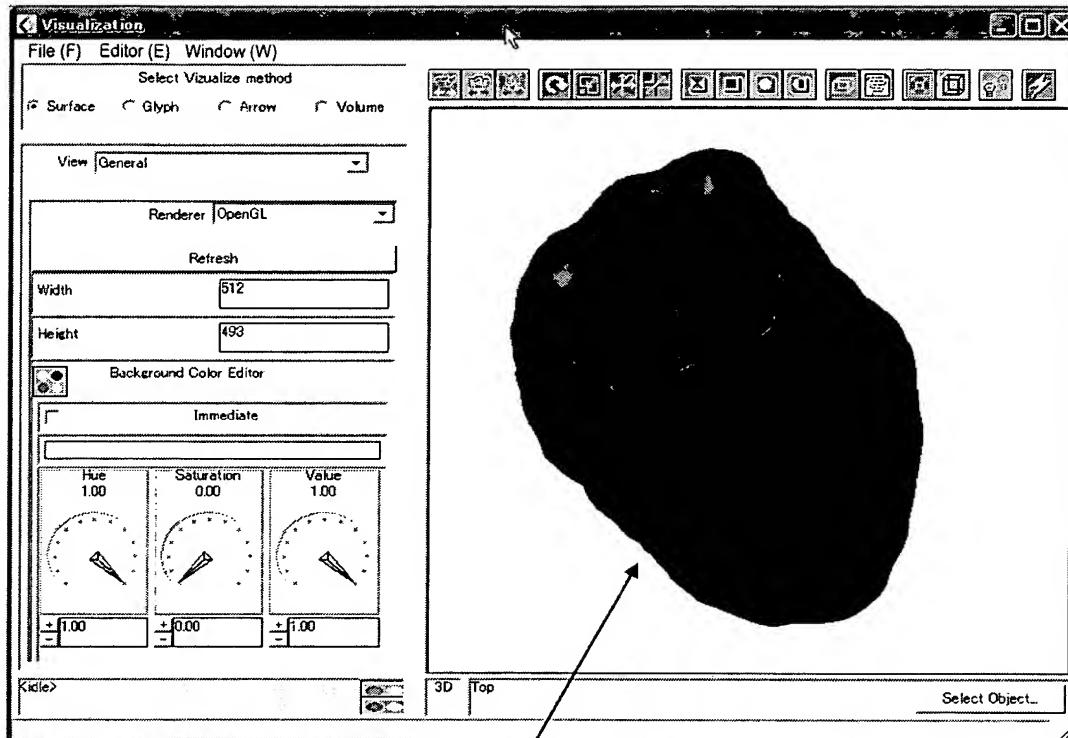
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1) [GUI -> SimulationController]setMeshData(3DMeshData)
2) [GUI -> SimulationController]setMaterialProperty(youngRatio)
3) [GUI -> SimulationController]setBoundaryCondition(staticWaterPressure)
4) [GUI -> SimulationController]setCellIDirection(surfaceElements)
5) [GUI -> SimulationController]setCellModels(cellModels)
6) [SimulationController -> CellSimulator]setCellModels(cellModels)
7) [SimulationController -> CellSimulator]getCellReductionForce(dt,length)
8) loop(7)
9) [SimulationController -> FEMSimulator]setSimulationData(SimulationData)
10) [SimulationController -> FEMSimulator]setCellIDirection()
11) [SimulationController -> FEMSimulator]setCellReductionForce(CellReductionForce)
12) [SimulationController -> FEMSimulator] getOrganDeformation(dt)
13) [SimulationController -> Visualizer]setOrganDeformation(OrganDeformation)
14) loop(12, 13)
15) goto(1)

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FIG.5



example of the display of a simulation of the heart

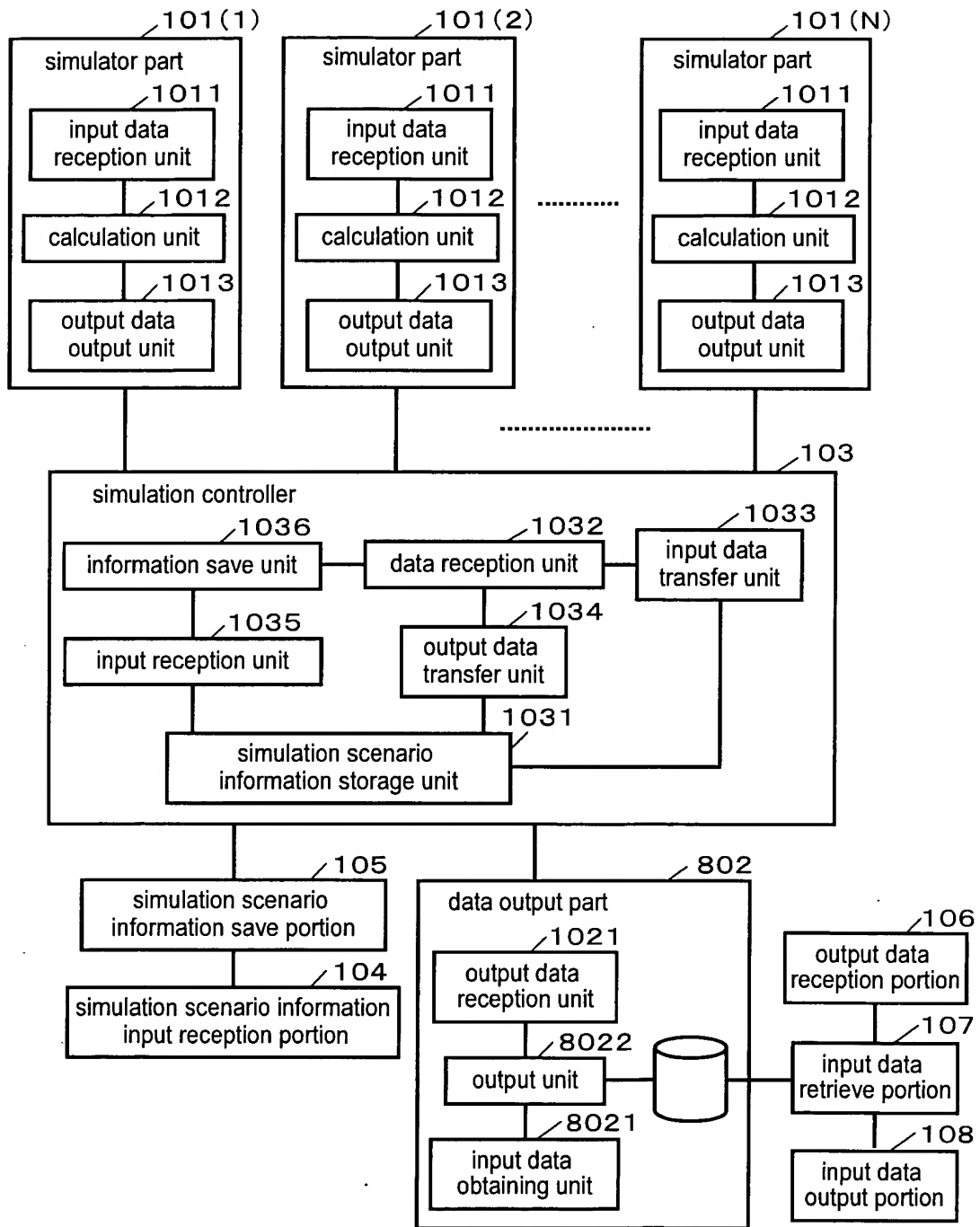
FIG.6

FIG.7

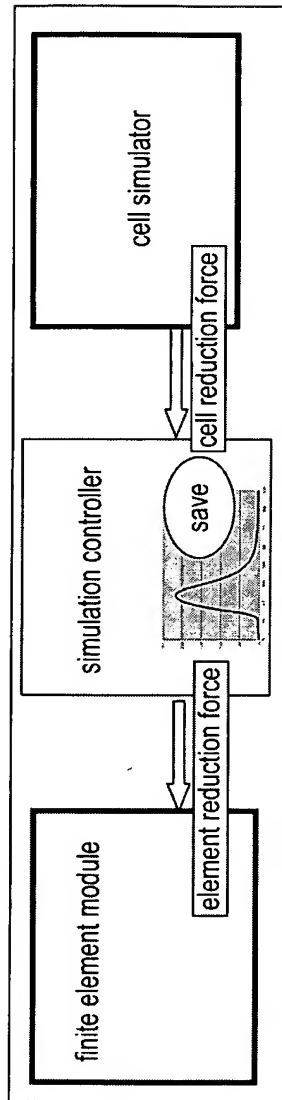


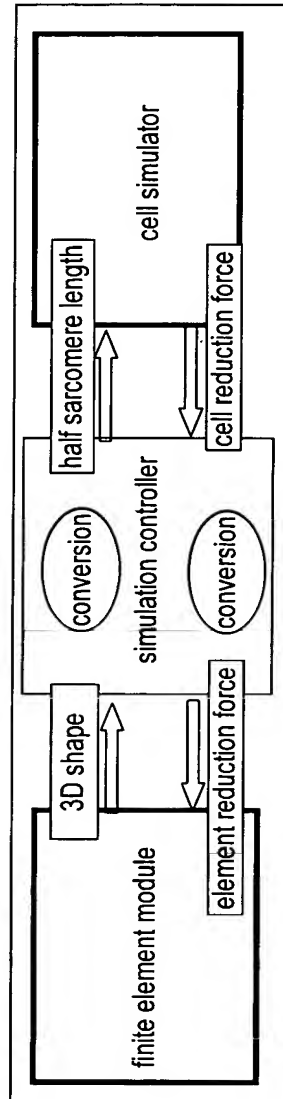
FIG.8

FIG.9

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1) [GUI->SimulationController]setMeshData(3DMeshData)
2) [GUI->SimulationController]setMaterialProperty(youngRatio)
3) [GUI->SimulationController]setBoundaryCondition(staticWaterPressure)
4) [GUI->SimulationController]setCellIDirection(surfaceElements)
5) [GUI->SimulationController]setCellModels(cellModels)
6) [SimulationController->CellSimulator]setCellModels(cellModels)
7) [SimulationController->FEMSimulator]setSimulationData(SimulationData)
8) [SimulationController->FEMSimulator]setCellIDirection(HuygheModel)
9) [SimulationController->FEMSimulator]getCellLength(length)
10) [SimulationController->CellSimulator]setCellLength(length)
11) [SimulationController->CellSimulator]stepGo(dt)
12) [SimulationController->CellSimulator]getCellForce(CellForce)
13) [SimulationController->FEMSimulator]setCellForce(CellForce)
14) [SimulationController->FEMSimulator]stepGo(dt)
15) [SimulationController->FEMSimulator]getOrganDeformation(Organ)
16) [SimulationController->Visualizer]setOrganDeformation(Organ)
17) loop(9,16)
18) goto(1)

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FIG.10

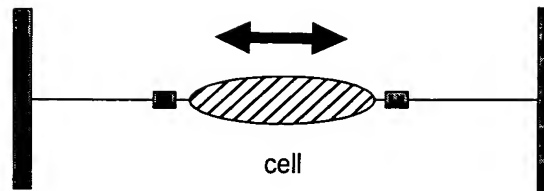


FIG.11